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C E R T I F I E D

[redacted] 21 June 1965 25X1

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Subject: [redacted] Project [redacted] 25X1
Progress Report - Month Ending May 31, 1965

Gentlemen,

Enclosed are five (5) copies of [redacted] Progress Report on Project [redacted] for the month ending May 31, 1965. 25X1 25X1

Since there was no information given as to whether or not copies of Progress Reports should be forwarded to the customer's technical representative, none have been sent. Please call us and let us know if any should be forwarded in the future. [redacted] 25X1

Very truly yours,

[redacted] 25X1

RJL/de

[redacted] 25X1

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18 June 1965

[redacted] 25X1

PROGRESS REPORT

For

Month Ending May 31, 1965

PROJECT STATUS

25X1 [redacted] Design

The layout of the basic light table is 60% complete. This does not include any part of the tilting base assembly whose design has not been started. The design follows fairly closely that described in our final report of February 1965, except the handwheels have been lowered and the overall dimensions have increased. (See [redacted] letter of 7 June 1965.) 25X1

In regard to film tensioning, it has been decided to design the tensioning mechanism to lightly grasp the film, apply tension to it and lower it to the film viewing surface. The tensioning rollers are rotary solenoid operated. The solenoids are controlled by switches coupled to the handwheels so that when any of the three handwheels is turned a switch is activated and remains activated as long as a turning torque is being applied to the handwheel. Releasing the handwheels causes the tensioning rollers to operate lowering the film and applying tension.

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The spool loading arrangement has been defined. It is intended that the operator, after setting the driving head to the correct position for the film spool used, will retract the drive spindle by pulling out a knurled knob on the end of the spindle. A button in the center of this knob must be depressed first to unlock the spindle from its normal drive position. The spindle will automatically lock in the loading position giving ample clearance between the ends of the spool holding pins to insert the film spool. The operator will load the spool by first slipping it on the idling, or non-driving pin and second releasing the drive spindle from its locked position (by again depressing the center button). The end of the spring loaded drive spindle will enter the film spool, thus supporting it. The operator then simply rotates the spool until the driving pins on the spindle find the drive slot in the spool and snap into place.

It has been decided that the center support originally designed to be folded out of the way when a single nine inch spool was to be loaded will instead be slid over to the side and still used to support the end of the film spool.

In regard to handwheel operating torques, every effort is being made to keep these at a minimum. Ball bearings are used wherever practical and the ratio between the handwheels and the spools in the slew mode has been set at 2.5 to 1.

Approved For Release 2002/08/20 : CIA-RDP78B04747A003000050045-5

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25X1 [redacted] Design

The design layouts [redacted] have not been started, however, it is planned to use as much of the [redacted] design in these instruments as possible. 25X1

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Engineering on the design of the magnetic coupling technique for the high intensity tracking light sources has been iniated and some experimental work performed.

Various techniques have been investigated for insuring that the film is held flat and steady when making high accuracy measurements. The original approach to this problem (which has not necessarily been discarded) was to rely on the application of tension to the film to maintain flatness. However, because of the construction of the film, absolute flatness cannot be achieved at any reasonable value of applied tension. This subject, being a potential problem area, is discussed later in this report.

The design of the micrometer heads for the measurement of microscope carriage position has been tentatively selected, and requests for quotation have been dispatched to a number of gage manufacturers. At present we have one acceptable reply from an American manufacturer. The micrometer head will be metric reading. The thimble will be approximately 2 inches in diameter. Each revolution will correspond to .5mm motion. There will be 250 graduations on the rotating thimble, each graduation representing two microns. Readings to one micron will be made using a single line vernier.

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PROJECTED WORK

The planned work for the coming month depends to a large extent on the success that we and the procuring agency achieve in the solution of a few problems in definition of the performance and equipment dimensions. Based on the assumption that problem areas of this type can be cleared up, the projected work is as follows:

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[redacted] Design

The layout of the light table portion will be completed and detailing started. The layout of the tilting base assembly will be started and should be 50% completed by next month. Selection of sources for long lead items such as the light source will be made.

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[redacted] Design

Layout of [redacted] designs will be started. 25X1

Engineering on the magnetic coupling for the high intensity light source will be completed, and problems of film flatness and hold-down resolved.

PROBLEM AREAS

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Size [redacted] - At present we require an increase in length of two inches over the 32 inches allowed, an increase in height of one inch over the 9 inches allowed and an increase in width of 1/2 inch over the 16 inches permitted. These are necessitated by the additional volume required by the manufacturer of the light source to guarantee a 10% uniformity.

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Handwheel forces required to transport film - It is believed that the handwheel torque required to transport film is going to be higher than desired, although we have no quantitative information on the magnitude of acceptable torque levels. To minimize this potential problem, ball bearings are being used wherever practical, and the drag brakes on all four spool drives are being made adjustable. In addition, the high speed or slew ratio has been set at 2.5:1.

Film flatness requirement - There are questions in our minds regarding the degree of film flatness desired and the degree of film flatness that can be achieved by the simple film tensioning technique proposed. 25X1 In the [redacted] design this does not appear to be a problem since no high accuracy measurements are being made. 25X1 In the case [redacted] however, the degree of film flatness could very well limit the range over which high accuracy measurements can be made. It is a fact that, with the films we have used, no amount of reasonable tension will cause the film to be truly flat. It is important, therefore, that an understanding 25X1 be reached between [redacted] the customer regarding the limitations on film flatness using this tension method. We feel that an in-person discussion of this problem is in order to properly consider the many factors of which we are not aware, i.e., types of films used, most common range of measurements, microscope magnification most generally used, etc. There are other techniques for achieving flatness, but incorporation would be at the expense of simplicity and would result in a more costly end product.